

## WHAT IS CLAIMED IS:

1. A method for controlling dental plaque in the oral cavity of a host, comprising administering to the oral cavity of the host an effective amount of a polypeptide having *S. mutans* murein hydrolase activity against one or more bacterial species occurring in dental plaque of the host.
2. The method of claim 1, wherein the polypeptide is an *S. mutans* murein hydrolase having a molecular weight of about 65 kDa.
3. The method of claim 2, wherein the polypeptide comprises the amino acid sequence of SEQ. ID NO. 6, or an amino acid sequence having at least 70% identity thereto.
4. The method of claim 2, wherein the polypeptide comprises the amino acid sequence of SEQ. ID NO. 8, or an amino acid sequence having at least 70% identity thereto.
5. The method of claim 1, wherein the host is a human.
6. The method of claim 5, wherein the polypeptide having murein hydrolase activity has murein hydrolase activity effective against one or more members selected from the group consisting of *Streptococcus mutans*, *Streptococcus parasanguis*, *Streptococcus oralis*, *Streptococcus sanguis*, *Streptococcus gordonii*, *Streptococcus sobrinus*, and *Actinobacillus actinomycetemcomitans*.
7. The method of claim 2, wherein the polypeptide having murein hydrolase activity has murein hydrolase activity against *Streptococcus mutans*, *Streptococcus parasanguis*, *Streptococcus oralis*, *Streptococcus sanguis*, *Streptococcus gordonii*, *Streptococcus sobrinus*, and *Actinobacillus actinomycetemcomitans*.

8. The method of claim 1, wherein said administering comprises delivering to the oral cavity an oral composition comprising the polypeptide having murein hydrolase activity, and an orally acceptable carrier.

5 9. The method of claim 8, wherein the oral composition is a mouthwash composition.

10 10. The method of claim 8, wherein the oral composition is a dentifrice composition.

11. The method of claim 8, wherein the oral composition is a chewing gum.

12. A method for lysing bacteria, comprising contacting the bacteria with a composition comprising a polypeptide having *S. mutans* murein hydrolase activity.

15 13. The method of claim 12, wherein the murein hydrolase comprises the amino acid sequence of SEQ. ID NO. 8, or an amino acid sequence having at least 70% identity thereto.

20 14. The method of claim 13, wherein the murein hydrolase comprises the amino acid sequence of SEQ. ID NO. 8, or an amino acid sequence having at least 80% identity thereto.

25 15. The method of claim 12, wherein the bacteria include one or more members selected from the group consisting of *Streptococcus mutans*, *Streptococcus parasanguis*, *Streptococcus oralis*, *Streptococcus sanguis*, *Streptococcus gordonii*, *Streptococcus sobrinus*, and *Actinobacillus actinomycetemcomitans*.

30 16. A method for controlling dental caries in the oral cavity of a host, comprising administering to the oral cavity of the host an effective amount of a purified

protein having a molecular weight of about 65 kDa and having an amino acid sequence having at least about 70% identity with the amino acid sequence of SEQ. I.D. NO. 6.

17. The method of claim 16 wherein the protein is recombinantly-produced.

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18. The method of claim 16 which comprises administering an oral composition comprising said protein and an orally-acceptable excipient.

19. The method of claim 17 which comprises administering to the host an oral composition comprising said protein and an orally acceptable excipient.

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20. The method of claim 18 wherein the oral composition is a mouthwash composition including water.

21. The method of claim 18 wherein the oral composition is a dentifrice composition including a polishing agent.

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22. The method of claim 18 wherein the oral composition is a chewing gum.

23. The method of claim 20 wherein the protein or the polypeptide fragment is recombinantly-produced.

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24. A recombinant polypeptide having an amino acid sequence corresponding to the amino acid sequence of SEQ. I.D. NO. 6 or a polypeptide fragment thereof.

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25. An oral composition comprising a purified protein having an amino acid sequence having at least 70% identity to SEQ. I.D. NO. 6 and an orally acceptable carrier.

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26. The composition of claim 25 which is a mouthwash composition.

27. The composition of claim 25 which is a dentifrice composition.

28. The composition of claim 25 which is a chewing gum.

5           29. An isolated DNA sequence encoding a protein including an amino acid sequence having at least 70% identity to SEQ. I.D. NO. 6 or a polypeptide fragment thereof.

10           30. A vector comprising a DNA sequence of claim 29 in operable association with a promoter.

31. A host cell comprising introduced DNA, said introduced DNA including a DNA sequence of claim 29 in operable association with a promoter.

15           32. A method of producing a polypeptide, comprising culturing a host cell of claim 31 under conditions sufficient to obtain expression of said DNA sequence.

33. The method of claim 32, and also comprising isolating the polypeptide

20           34. An article of manufacture, comprising:  
an oral composition comprising a polypeptide having *S. mutans* murein hydrolase activity, and an orally acceptable carrier; and  
visible indicia relating to use of the oral composition to control dental plaque.

25           35. The article of claim 34, wherein the polypeptide is a *S. mutans* murein hydrolase having a molecular weight of about 65 kDa.

30           36. The article of claim 35, wherein the polypeptide comprises the amino acid sequence of SEQ. ID NO. 8, or an amino acid sequence having at least 70% identity thereto.

37. The article of claim 36, wherein the polypeptide comprises the amino acid sequence of SEQ. ID NO. 8, or an amino acid sequence having at least 80% identity thereto.

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38. The article of claim 35, wherein the murein hydrolase has activity against one or more members selected from the group consisting of *Streptococcus mutans*, *Streptococcus parasanguis*, *Streptococcus oralis*, *Streptococcus sanguis*, *Streptococcus gordonii*, *Streptococcus sobrinus*, and *Actinobacillus actinomycescomitans*.

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39. The article of claim 37, wherein the polypeptide having murein hydrolase activity has murein hydrolase activity against *Streptococcus mutans*, *Streptococcus parasanguis*, *Streptococcus oralis*, *Streptococcus sanguis*, *Streptococcus gordonii*, *Streptococcus sobrinus*, and *Actinobacillus actinomycescomitans*.

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40. The article of claim 32, wherein the oral composition is a mouthwash composition.

41. The article of claim 34, wherein the oral composition is a dentifrice composition.

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42. The article of claim 34, wherein the oral composition is a chewing gum.